PERCEPTION AND REALITY

Measuring Digital Skills in Europe

Contents

EXECUTIVE SUMMARY

Five ECDL National Operators carried out digital literacy studies in their countries: Austria, Denmark, Finland, Germany and Switzerland. The studies consisted of two key parts: self-assessment and practical assessment of digital skills. The findings revealed that people tend to over-estimate their skills and that significant skills gaps exist even in the analysed countries, which are usually considered to be digitally advanced. Moreover, young people have digital skills gaps that are as wide as in the rest of society.

Many international indicators are based on activities that people self-report to carry out on their computers or online. In fact, these indicators do not measure how good people are at these activities and if they have the right skills to carry them out effectively and safely. Only practical tests can reliably check the actual levels of digital skills.

Structured training and certification have a positive impact on final performance. Moreover, certification objectively evaluates training quality and provides proof of the skills acquired. Thus, all self-assessment tools (such as the Europass CV digital competence grid) should be complemented with a diploma or a certificate as evidence of the claimed competence level.

The insufficient levels of digital skills have a negative impact on business development. Data from the Netherlands, Greece and Singapore shows that employees waste a significant amount of their working time when dealing with difficulties related to digital applications. Following digital training and certification, considerable savings in time and money can be achieved in solving these application-related problems.

1. Introduction

Our day-to-day lives are more and more dependent on digital technologies. Life without a computer, a tablet or a mobile phone has become unimaginable, and more people than ever have access to the internet. There are 134 mobile subscriptions per 100 people in the EU and 83% of households in Europe have access to the internet at home[1]. These impressive numbers can create an illusion that, by having access to digital technologies, people automatically know how to use them. People tend to assume that if they own a digital device and know how to use certain applications, then they already have all the necessary skills for personal and professional life.

A number of the National Operators of ECDL in Europe have carried out digital literacy studies to find out what the actual digital skills levels in their countries are. Austria, Denmark, Finland, Germany and Switzerland are all considered to be digitally advanced countries – they appear at the top of various international digital development indexes (for example, the Digital Economy and Society Index developed by the European Commission). However, surveys conducted in these countries revealed that gaps exist between self-perceived and actual levels of digital skills. Even young people, who are falsely assumed to be 'digital natives', usually under-perform in practical tests. This paper provides an overview of the main findings of the five studies and discusses their implications for digital skills development on the national and European levels.

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1   European Commission, Digital Agenda Scoreboard, 'Mobile take up', 2014; 'Households with access to the internet at home', 2015.

2.   Digital Skills Studies by ECDL National Operators

The digital skills studies in Austria, Denmark, Finland, Germany and Switzerland were carried out between the end of 2013 and the start of 2015. In Austria and Switzerland, a representative group of participants aged between 15 and 64 was analysed, whereas in Denmark, Finland and Germany, the research was focused on young people: first year university students and final year higher-tier secondary education students.

All of the studies were based on the same research logic. First, respondents were requested to self-assess their digital skills in the areas of ECDL Base modules: Computer Essentials[2], Online Essentials[3], Word Processing and Spreadsheets. Then, they were invited to answer some practical questions and to complete assignments in a simulated work environment. Results from these studies allowed a comparison between self-assessed and actual digital skills levels.

The key findings were consistent throughout the five European countries. First, self-assessment is a poor predictor of actual performance and people tend to over-estimate their digital skills. Second, digital skills gaps exist in all the surveyed countries, despite the fact that they are more digitally developed than many other countries in Europe and worldwide (see Figure 1). Third, digital skills gaps are persistent among young people as well as their older counterparts. Fourth, people who have previously acquired digital skills certification perform better than those without such a certification.

Index	No. of Countries	Austria	Denmark	Finland	Germany	Switzerland
Digital Economy and Society Index (DESI), 2016	28	12	1	4	9	N/a
ICT Development Index, 2015	167	25	2	12	14	7
Network Readiness Index (NRI), 2015	143	20	15	2	13	6

Figure 1: International indexes aggregating ICT indicators: DESI, ICT Development Index, and NRI.

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2   The syllabus of the Computer Essentials Module consists of the following categories: Computer and Devices, Desktop, Icon, Settings, Outputs (working with text and printing), File Management, Networks, Security and Well-Being.
3   The syllabus of the Online Essentials Module consists of the following categories: Web Browsing Concepts, Web Browsing, Web-Based Information, Communication Concepts and Using E-mail.

3.   Self-Assessment is a Poor Measure of Digital Skills

Results from all of the five countries indicate that people cannot adequately assess their digital skills. Respondents incorrectly evaluate their competences, most often by overestimating. For example, in Austria, 94% of survey participants assessed their general computer skills as 'average' to 'very good'. However, in the practical test, only 39% of them scored that high (see Figure 2).

Actual Skills
Self-assessed skills

Source: OCG, 2014

Figure 2: Self-assessment vs. actual general computer skills. Results from the study carried out in Austria. OCG, 2014.

Austrian study by OCG*

- January to February 2014
- Representative group of participants from 15 to 60 years of age
- 1,260 respondents; 494 took a practical test

Main findings:

- Austrians own multiple digital devices and they use them often. For example, 66% of the respondents indicated that they have notebooks and/or smartphones and access to the internet at home.
- The Austrian population tends to overestimate their digital skills. For example, almost half of the respondents indicated that they have very good skills in computer essentials, whereas only 7% of them scored 'very well' in the practical test.

* A full description of the study is available in the Annexes

It is natural that people tend to see themselves in a positive light. Sometimes they assume that they automatically develop the right skills simply by using digital applications. High self-assessment is also driven by a willingness to perform better or by trying to impress potential employers. In order to avoid self-evaluation bias, an objective measure of actual skills is necessary.

Certification is the right tool to measure the real levels of digital skills. It defines skills and knowledge that individuals need and it measures training quality, providing proof of the skills acquired. Digital skills certification also demonstrates a person's competence to potential or current employers.

As a consequence, if self-assessment tools are used, they need to be complemented by a diploma or a certificate as evidence of the competence level claimed. One of the best known examples in this area is the Europass CV template. Its 'Digital competence' section is based on a self-assessment grid, but it also requires users to add a certificate (see Figure 3).

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Independent user	Independent user	Proficient user

Digital competences - Self-assessment grid

ECDL Advanced (Word Processing, Spreadsheets, Database, Presentation)

Figure 3: Europass CV. Example of how to complete the section on digital competence.

Self-assessment bias should be kept in mind when analysing the various indexes and digital skills indicators. For example, the 'Human Capital' dimension of the DESI indicator is based on the indicators that measure behaviour, such as, "Sending / receiving emails", "Participating in social networks" or "Finding information about goods and services"[4]. These indicators are based on the assumption that people who have done certain activities, have the corresponding skills. In fact, they say nothing about how effective and safe people are in carrying out these activities, nor if they achieve the desired results. Practical assessments seem to be the only definitive way to check the actual level of digital skills. Regarding this topic, Vincenzo Spieza, Senior Economist at OECD writes that, "Digital skills under human capital (DESI) are measured based on what people do with digital technologies …, not on how good they are at these activities. Skills assessments … suggest that digital skills remain too low to enable effective use of digital technologies at work and in daily life"[5].
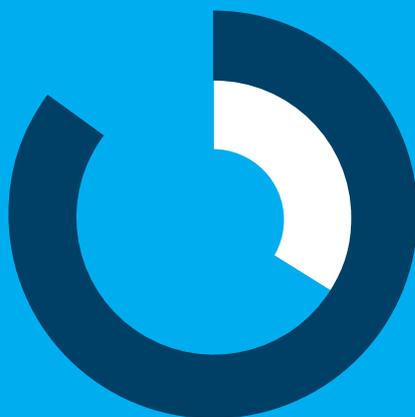
Actual Skills
Self-assessed skills

Source: ECDL Switzerland, 2015

Figure 4. Digital skills gaps in Switzerland. Study carried out on behalf of ECDL Switzerland AG, 2015.

Swiss study by ECDL Switzerland AG*

- Spring 2015
- Representative group of participants from 15 to 64 years old
- 2,050 respondents; 492 took a practical test

Main findings:

- Despite being well-equipped with PCs and using them frequently, the Swiss population has a poor level of basic computer skills – the average practical test result of the participants was 46%.
- The Swiss inadequately assess their digital skills levels. 67% of the participants described their skills as "very good / good" but only 31% of them actually achieved a corresponding test result.

* A full description of the study is available in the Annexes

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4   European Commission, "Monitoring the Digital Economy & Society 2016-2021", 2015, http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=13706. The information is collected about activities realised during the previous 3 months by internet and computer users. See also European Commission "Digital Skills Indicator – derived from Eurostat Survey on ICT usage by Individuals. Methodological note 2015".
5   Vincenzo Spiezia, "Measuring progress in Europe's digital economy", 26 February 2016, https://ec.europa.eu/digital-single-market/blog/measuring-progress-europes-digital-economy.

4.   Digital Skills Gaps Exist in all Surveyed Countries

Results from all five countries have shown that people have insufficient levels of digital skills. For example, despite being well-equipped with PCs and using them frequently, the Swiss population has a poor level of basic computer skills. 85% of survey respondents indicated that they were 'good' or 'very good' in using the internet and e-mail, whereas in reality, only 34% of them scored that high (see Figure 4)

The Swiss study also found that the best results in the practical test were achieved by people who use PCs intensively at work (those who spend more than three quarters of their working time at the computer) and those who developed their digital skills as part of structured education or training. Finally, ECDL certificate holders scored 24% better in practical tests than participants without certification. In Germany, holders of ICT certificates performed 12% better than respondents without similar certification.

Danish study by Dansk IT
- Academic year 2013-2014
- First year university students
- 183 respondents

Main findings:
- Danish students scored quite high in 'Concepts of ICT' (93% of correct answers) and in 'Using Computers and Managing Files' (82%). However, their skills in working with 'Spreadsheets and Presentations' remain relatively low (57% and 58% respectively).
- Students tend to over-estimate their skills in most digital areas. For example, 89% of respondents claimed to be very or quite confident in working with spreadsheets but only 57% of them answered the practical questions correctly.

Finnish study by ECDL Finland
- Academic year 2013-2014
- First year university students
- 62 respondents**

Main findings:
- Finnish students are quite confident about their digital skills levels. Their confidence varies from 98% in 'Web Browsing and Communications' to 74% in using spreadsheets.
- Actual skills of survey participants in some of the key digital areas are strikingly low: Spreadsheets – 37%; Presentation – 60% correct answers.

German study by DLGI
- Q1-Q2 of 2014
- First year university students and final year higher-tier secondary education students
- 673 respondents

Main findings:
- German students' confidence varies from 79% in spreadsheets to 93% in 'Web Browsing and Communications'.
- Results of the practical tests are considerably lower: only 38% of correct answers in Spreadsheets and 71% - in 'Web Browsing and Communications'

* A full description of the study is available in the annexes.

** The results from Finland need to be considered in the context of a relatively small sample size, but they are still worth considering as an indication of the digital skills of that Finnish cohort.

5. The Fallacy of the 'Digital Native'

Research in Denmark, Finland and Germany provides evidence that young people are not as digitally skilled as often assumed by society. The widest gaps between self-assessed and actual skills exist in productivity applications such as spreadsheets and presentation software. This could be explained by the difference between digital 'lifestyle' and 'workplace' skills. Young people develop skills that are associated with social media, games, online music and video; however, the skills that they need for their studies and future workplaces remain poor[6]. For example, in Germany, 79% of students were 'very' or 'quite' confident in using spreadsheets, but in fact, just 38% of them were able to answer the practical questions correctly (see Figure 5).


Actual Skills
Self-assessed skills
Source: DLGI, 2014
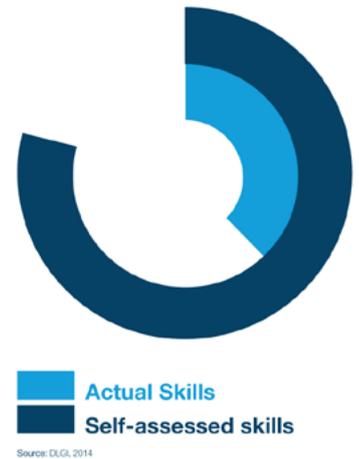
Figure 5. Self-assessment vs actual skills of young people using Spreadsheets. Study carried out in Germany by DLGI, 2014.

6. The Cost of Digital Ignorance

The digital skills studies in the five European countries revealed wide digital skills gaps. How do these gaps affect the economy in general and business in particular? There are a number of studies that estimate the cost of digital ignorance in terms of time and money. For example, a study conducted by the University of Twente concluded that the cost of lost time due to employees' lack of digital skills amounts to €19.3 billion a year in the Netherlands alone[7].

The ALBA study carried out in Greece found out that, on average, employees spend from 48 to 148 minutes a week dealing with difficulties using digital applications, depending on the application used[8]. The time lost, not only reduces the productivity of employees, but also of their colleagues who are trying to help them. The study reveals that after ECDL certification, the time wasted on dealing with digital problems decreases substantially. Following digital training and certification, considerable savings (up to 63 hours a year) can be achieved in dealing with application-related difficulties[9].

The Institute of Adult Learning in Singapore also carried out a study based on the same research logic[10]. Research participants indicated that they spent, on average, 151 minutes per week dealing with difficulties related to digital applications. Researchers converted this time to dollars based on an average hourly rate of S$19.50 (€12.60). As a consequence, the measurement revealed that organisations lost S$49 (€32) per employee, per week, and S$2,356 (€1,523) per employee, per year. After taking ICDL[11], the time spent dealing with computer problems decreased by, on average, 26 minutes a week, which amounts to saving of S$406 (€262) per employee, per year, a 17% saving from the initial cost.

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6   For more information around this topic, please see ECDL Foundation, "The Fallacy of the 'Digital Native': Why Young People Need to Develop their Digital Skills", 2014, http://www.ecdl.org/media/TheFallacyofthe'DigitalNative'PositionPaper1.pdf.

7   University of Twente. Center for e-Government Studies "CTRL ALT DELETE. Lost productivity due to IT problems and inadequate computer skills in the workplace", 2012, http://www.alexandervandeursen.nl/Joomla/Articles/Reports/2012%20-%20CTRL_ALT_DEL_ENG.pdf

8   For more information, please see ECDL Foundation "IT skills: the business gain", 2011, http://www.ecdl.org/media/Alba%20Study%20Summary_Final.pdf

9   For more information, please see ECDL Foundation "IT skills: the business gain", 2011, http://www.ecdl.org/media/Alba%20Study%20Summary_Final.pdf

10   Institute for Adult Learning Singapore "Evaluation of WSQ ICDL Digital Literacy Training", 2013, http://www.icdlasia.org/icdl-news?i=811

11   ECDL programme is known as ICDL (International Computer Driving Licence) outside of Europe.

All of these studies show the high cost of digital ignorance for organisations, as well as for the economy as a whole. In an era where 'digital' is a key element to business success, not having the right digital skills could be critical for business survival. The European Commission's data shows that one third of the EU labour force has an insufficient level of digital skills, with the highest percentages in Bulgaria (61%) and Romania (77%)[12]. Structured digital skills training and certification programmes are necessary to ensure that this challenge is properly met.

7. Conclusions

- People who have access to digital technologies and the internet do not automatically develop the digital skills that they need for personal and professional life. This is also, and especially, valid for young people who mainly use the internet for entertainment purposes. Productivity skills, such as working with text documents and spreadsheets, working collaboratively, etc., should be developed by delivering structured education, training and certification programmes.
- Self-assessment is a poor measure of digital skills. As people tend to overestimate their competences, practical tests seem to be the only reliable way to check their actual skills levels. Consequently, any statistical indicators that are based on self-reported digital skills should be treated with a certain amount of caution. Moreover, self-assessment tools should always be complemented by a diploma or a certificate, which is an objective measure of digital skills.
- Digital skills gaps exist, even in digitally advanced countries such as those analysed in this paper: Austria, Denmark, Finland, Germany and Switzerland. This can cause significant time and money losses for European businesses and the economy on the whole. Research shows that digital education and training improves overall performance, and digital certificate holders perform better than those without similar certification.
- Numerous efforts are being taken, on both European and national levels, in the area of skills development. The European Commission is working on the New Skills Agenda for Europe[13]. The 2014-2020 programme period of the EU Structural Funds is beginning in EU Member States, and countries are updating their national strategic documents: for example, in September 2014, the UK launched its new computing curriculum[14], and in July 2015, the Czech Republic adopted the new "Digital literacy strategy for the period 2015-2020[15]". It is crucial to ensure that development of digital skills on European and national levels is promoted and supported in a consistent and structured manner.

Standardised, internationally-recognised and vendor-neutral certification such as ECDL offers a way of measuring return on investment in skills development programmes inside and outside formal education. ECDL programmes are based on a flexible modular structure that allows the creation of profiles that match individual and organisational needs.

For more information, please visit our website: http://www.ecdl.org/programmes/ecdl_icdl

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12   European Commission, "Human Capital: Digital Inclusion and Skills", 2015, http://ec.europa.eu/newsroom/dae/document.cfm?action=display&doc_id=9931.
13   https://ec.europa.eu/priorities/work-programme-2016_en
14   UK Department of Education, "National curriculum and assessment from September 2014", https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/358070/NC_assessment_quals_factsheet_Sept_update.pdf
15   http://www.cedefop.europa.eu/en/news-and-press/news/czech-republic-new-strategy-promoting-digital-literacy?src=email&freq=weekly

ABOUT ECDL FOUNDATION

ECDL Foundation is an international organisation dedicated to raising digital competence standards in the workforce, education and society. Our certification programmes, delivered through an active network in more than 100 countries, enable individuals and organisations to assess, build and certify their competence in the use of computers and digital tools to the globally-recognised ECDL standard.

As a nonprofit social enterprise ECDL Foundation benefits from the unique support of experts from national computer societies and partners worldwide to develop vendor-independent standards which define the skills and knowledge required to use digital technology effectively. We work with education and training partners, local and regional authorities, national governments, international development organisations as well as public and private sector employers in all sectors, in the delivery of our programmes.

The quality and reputation of ECDL is built on almost twenty years of experience in delivering our certification programmes to over 14 million people and in more than 40 languages worldwide, with more than 2.5 million ECDL tests taken annually. Our success is maintained by our ongoing innovation in certification programme development, our commitment to rigorous test design methodologies, and consistent adherence to our quality assurance standards.

ECDL Foundation supports the initiatives of National Operators of the programme in Europe and the Arab States from our headquarters in Dublin, Ireland and our European office in Brussels, Belgium. We have also established three regional operations – ICDL Africa (based in Rwanda), ICDL Asia (based in Singapore) and ICDL Americas (based in Panama). All ECDL Foundation operations work closely with regional, national and local partners to develop the global network of ECDL Accredited Test Centres.